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(54) COMPOSITION CONTAINING STABILIZED HYDROGEN PEROXIDE TO CLEAN AND DISINFECT AND TO REMOVE BLOOD FROM MEDICAL INSTRUMENTS

(57) ABSTRACT

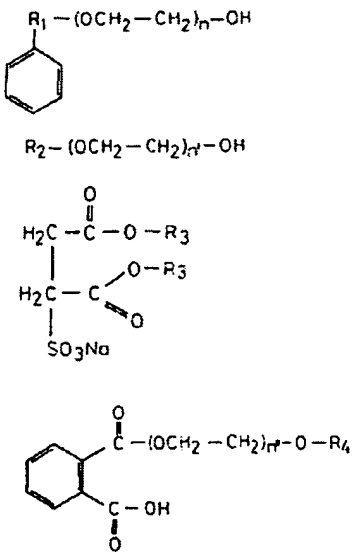
The subject of the invention is a disinfecting detergent composition with enhanced wetting ability containing stabilized hydrogen peroxide that contains 20 mass parts of alkylphenol polyglycol ether and/or alkyl polyglycol ether with the general formula (I) and/or (II), wherein the general formula (I) R_1 is an alkylene group having from 6 to 18 carbon atoms, n means from 6 to 12, while the general formula (II) R_2 is an alkyl group having from 8 to 20 carbon atoms or a mixture of these, n' means from 2 to 8 and in 20 mass parts of compound with the general formula (I) and/or (II) it contains

from 0.1 to 3 mass parts of dialkyl sulphosuccinate – containing sodium salt – with the general formula (III), wherein the general formula (III) R_3 is an alkyl group having from 6 to 12 carbon atoms,

from 1 to 4 mass parts of the acid half ester of alkyl polyglycol ether phthalate with the general formula (IV), wherein the general formula (IV) R_4 is an alkyl group having from 6 to 18 carbon atoms or a mixture of these, value of n" is from 2 to 8,

from 8 to 12 mass parts of hydrogen peroxide, and as desired, from 1 to 20 mass parts of viscosity modifier, ethyl alcohol favorably, complex builder, disodium salt of ethylenediaminotetraacetate favorably, passing additive, phosphorous acid favorably, excipient providing surface brightness

Description size: 10 pages, 4 formulae



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to the cleaned instrument, citric acid, salicylic acid, fumaric acid and fragrances and color additives favorably and the mixture of these.

The subject of the invention is a disinfecting detergent composition with enhanced wetting ability containing stabilized hydrogen peroxide that is suitable for removing blood from and disinfecting and cleaning of medical hand instruments and devices before sterilization.

Before sterilization, the following tasks must be done according to specific technological regulations:

- flushing
- disinfection
- soaking
- mechanical cleaning and removal of blood
- drying

Instruments and devices pre-treated and disinfected by the above procedure steps are to be sterilized afterwards. As it is known, sterile condition is a higher quality condition than the disinfected condition, although achieving a sterile microbiological state greatly depends on the effectiveness of the previous disinfecting procedure.

The purpose of the invention is to provide a hydrogen peroxide composition that cleans, disinfects and removes blood from medical instruments before sterilization in a single procedure.

Basically, two aspects were to be considered during achievement of the invention's purpose:

- to provide a storage-stable, tenzide containing product with good cleaning effect, in which the key ingredient hydrogen peroxide does not deteriorate between manufacture and use.
- to provide a hydrogen-peroxide-containing product that completely resolves high-level cleaning of special medical instruments.

To fulfill the latter criterion it was important to take into consideration that the devices to be cleaned such as needles, scissors, chisels, vessel clamps, dissecting instruments, forceps, hooks, retainers etc. are complex instruments with articulated surfaces, where effectiveness of cleaning and disinfection basically depends on the ability of the applied agent to penetrate into often very narrow gaps, i.e., on its intensive wetting ability. Russel, A.D-Hugo, E.B-Ayliffe, G.A.J. also highlight the importance of wetting ability among the requirements of disinfectants and cleaning agents when processing medical instruments and devices in their work Principles and Practice of Desinfection, Preservation and Sterilisation [*sic*] (Blackwell Scientific Publication, Oxford, 1982).

When resolving the task according to the invention our starting point was the basic experience that ethoxylates belonging to the group of nonionic tenzides increase stabilization of hydrogen peroxide, i.e., H_2O_2, while prone to deterioration in aqueous media, it is stable in composition with ethoxylate type detergents. An example of that is Europe patent description No. 195619 where the wash-active composition contains 20 mass percent of fat alcohol ethoxylate and 55 mass percent of 27.5% hydrogen

peroxide. American patent description No. 4 311 618 describes a composition of hydrogen peroxide and an ethoxylate-type nonionic surfactant agent suitable for textile cleaning. GDR patent description No. 218 631 describes a stable product based on polyglycol ether and hydrogen peroxide that is suitable for disinfecting cleaning of flat and smooth surfaces. Japanese patent description No. 59-120 700 describes a composition wherein hydrogen peroxide and alkyl polyglycol ether composition is mixed with complex builders and is suitable for cleaning of greasy and oily surfaces.

Based on all of the above a composition may be assumed known that contains alkyl and/or alkyl-alkylaryl ethoxylates as wash-active agent and hydrogen peroxide as disinfectant. Considering the purpose of the invention, however, it is a serious disadvantage that nonionic tenzides such as ethoxylate-type surfactants have very low wetting ability, therefore are not suitable for wetting and blood removal type cleaning of instruments with complex, articulated surfaces e.g. needles, forceps etc. because due to their low wetting ability they are unable to take the active agent in aqueous solution inside small diameter surfaces.

This characteristic of ethoxylate-type surfactants is thoroughly detailed by Schönfeldt, N. in the book titled Grenzflachenaktive Athylenoxid Addukte, Stuttgart, Wissenschaftliche Verlaggesellschaft MBH (1976).

Results of published theories were supported by experiments conducted on hydrogen peroxide-ethylene oxide adducts in aqueous media. Results of experiments using various ethoxylate-hydrogen peroxide compositions in aqueous media led to the conclusion that as a result of their inadequate wetting effect, these compositions are not suitable for the purpose of the invention.

In order to achieve the task of the intervention, the above hydrogen peroxide-ethylene oxide adduct composition needs to be supplemented by a third component with quick wetting effect that not only does increase effectiveness of the disinfectant and the detergent but carries the active agents to the parts with articulated, special geometric characteristics through quick wetting of narrow gaps, needles and articulated surfaces. As a result of the conducted experiments it could be determined that sodium salts of dialkyl sulphosuccinate are the most suitable agents for this.

As it is known in tenzide chemistry, sodium salts of dialkyl sulphosuccinate with certain molecular structures have outstanding wetting ability (Juhász, É-Lelkesné-Erős, M: Felületaktív anyagok zsebkönyve, Műszaki Könyvkiadó, Budapest 1979). Regarding molecular structure, dialkyl sulphosuccinates with alkyl groups having eight carbon atoms have an optimal wetting effect.

Various commercial products with aqueous media for quick wetting contain sodium salt of dioctyl sulphosuccinate. These products include but are not limited to Aerosol OT (Cyanamid Co., New Jersey, USA), SBS-Netzer (Barlocher A.D. – West Germany), Spolion-8 (Slovnaft – Czechoslovak Socialist Republic) and Solovet (Egyesült Vegyiművek - Budapest). During experiments to achieve the invention's purpose, due to practical reasons, the above mentioned, locally produced product named Solovet was used that is a 25 mass percent aqueous solution of sodium salt of dioctyl sulphosuccinate.

Many experiments proved that triple system of alkyl or alkyl-aryl ethoxylate – dialkyl sulphosuccinate sodium salt – hydrogen peroxide is suitable for resolving the task of the invention's purpose regarding antimicrobial effect, blood removal and cleaning effect. It is a serious problem however that the dioctyl sulphosuccinate sodium salt (Solovet) in this terner system breaks down and inactivates hydrogen peroxide in the composition quickly. This fact is not surprising knowing the chemical characteristics of hydrogen peroxide. As it is known, hydrogen peroxide deteriorates heavily in alkaline media, especially in presence of Na^+ ions. Nevertheless, the other above detailed complex advantages (cleaning effect, blood removal, bactericide, virucide, fungicide effect) of the ethoxylate – Solovet – hydrogen peroxide triple system could not be given up.

During our studies aimed to resolve the invention task our basic goal was to stabilize hydrogen peroxide in the ethoxylate – Solovet – hydrogen peroxide triple system and to prevent its deterioration.

There are many references in patent literature stating that hydrogen peroxide in composition of various surfactants can be stabilized with excipients. Thus Soviet patent description No. 899 620 describes a degreasing and cleaning agent composition where hydrogen peroxide mixed with nonionic and amphoteric surfactants is stabilized with aliphatic or aromatic amins. American patent description No. 4 510 018 describes stabilizing effect of fatty acid amin on hydrogen peroxide. Because of their toxic effect, amins are not suitable for resolving our invention purpose. Same reasons exclude application of solution described in Japanese patent description No. 79-10 309 where stabilization of hydrogen peroxide is provided by heavy metal carbonates. Authors of Soviet patent description No. 1 183 473 recommend the very toxic oxalic acid for the same purpose, while American patent description No. 4 133 869 discusses stabilization of hydrogen peroxide by metal cyanides.

Without reviewing further patent references it can be determined that the known hydrogen peroxide stabilizing procedures and solutions cannot be applied in hydrogen peroxide detergent products used during treatment of instruments and devices used in medicine

and patient care. Another difficulty was that despite our wide range literature research, no composition suitable for cleaning was found that had contained hydrogen peroxide and dioctyl sulphosuccinate sodium salt simultaneously.

During the achievement of the invention purpose, a basic aspect was that a solution or excipient should be applied to stabilize the hydrogen peroxide present in the composition that satisfies the requirements of medical use, does not react with other components of the composition, does not develop corrosion and does not damage the treated surfaces in any other way. Another aspect was that the applied H_2O_2 stabilizer should not be indifferent regarding the cleaning and blood removing effect and it should not decrease the effectiveness of the wash-active composition. For this purpose, both practically and theoretically, acidic tenzides were taken into consideration.

During our research conducted with synthetic detergents our conclusion was that deterioration of hydrogen peroxide in the triple system of alkyl and/or alkyl-aryl ethoxylate – dioctyl sulphosuccinate – hydrogen peroxide constituting the base of the invention can be practically completely prevented and the hydrogen peroxide can be stabilized if acidic half ester of alkyl ethoxy phthalate with the general formula (IV) is added to the composition in a specified ratio. It was discovered that hydrogen peroxide remains stable in presence of surfactants alkyl and/or alkyl-aryl ethoxylate and dioctyl sulphosuccinate (Solovet) if acidic half ester of alkyl ethoxy phthalate with the general formula (IV) is present in a specified ratio.

Additionally it was discovered that the wetting effect of dioctyl sulphosuccinate present in the composition having a quick wetting effect is further increased by the component with general formula (IV) originally aimed to stabilize H_2O_2, thus significantly improving the general cleaning, blood removing and disinfecting effectiveness of the composition. The above two discoveries are surprising because none of the other acidic half esters of alkyl phthalates similar in structure to the acidic half ester of alkyl ethoxy phthalate with general formula (IV) show advantageous characteristics regarding hydrogen peroxide stabilization or wetting ability. Consequently, only those acidic phthalate esters are favorable for both stabilizing hydrogen peroxide and increasing wetting ability that have an alkyl ethoxylate – i.e., ethoxylated fatty alcohol – group in ester binding.

The alkyl-aryl ethoxylate or alkyl ethoxylate present in the composition of the invention and responsible for the cleaning effect – and that can be described by general formulae (I) and (II) detailed below – may be alternatively replaced by each other, i.e., any of them may be used alone in the composition but

– without noticeably affecting the complex effect of the composition – the ethoxylate-type nonionic tenzides characterized by general formulae (I) and (II) may be used together in optional ratio within the range of the application concentration. Therefore, the invention is a water-soluble or soluted disinfecting, virucide and fungicide detergent composition with increased quick wetting characteristics and containing hydrogen peroxide that is suitable for blood removal from and general cleaning of medical instruments and devices and exceeding the above listed effects.

Characteristic of the composition that it contains 20 mass parts of alkylphenol polyglycol ether with general formula (I) and/or alkyl polyglycol ether with general formula (II) alternatively, alone or in a mixture or optional ratio where in formula (I) R_1 is an alkylene group having from 6 to 18 carbon atoms, n means from 6 to 12, in general formula (II) R_2 is an alkyl group having from 8 to 20 carbon atoms or a mixture of these, n' means from 2 to 8 and in 20 mass parts of compound with general formula (I) and/or (II) it contains from 0.1 to 3 mass parts of dialkyl sulphosuccinate sodium salt with general formula (III), wherein general formula (III) R_3 is an alkyl group having from 6 to 12 carbon atoms, from 1 to 4 mass parts of acid half ester of alkyl ethoxy phthalate with general formula (IV), wherein general formula (IV) R_4 is an alkyl group having from 6 to 18 carbon atoms or a mixture of these, value of n" is from 2 to 8. Alkyl polyglycol ether with general formula (II) and half ester phthalic acid with general formula (IV) are not uniform regarding the carbon atom number of the R_2 and R_4 alkyl groups, therefore it can be a mixture of compounds with general formulae (II) and (IV) that have various types of R_2 and R_4 alkyl groups being in the given carbon atom number range.

The antimicrobial and blood removal effect of the invention composition is provided by 8-12 mass parts of hydrogen peroxide component calculated for concentrated active agent and applied in commercially available aqueous solution.

Apart from the listed, if desired, without modifying the basic function of the composition, it may contain ethyl alcohol that improves the disinfecting effect but basically modifies viscosity, complex builder improving hard water durability for example disodium salt of ethylenediaminotetraacetate, corrosion preventing or passing additive for example phosphorous acid, excipient providing surface brightness to the treated and cleaned instrument for example citric acid, fumaric acid, salicylic acid and fragrances and color additives in 1 to 20, favorably at least in 10 mass parts.

A composition with the antimicrobial blood removing and general cleaning effect of the invention can be prepared by mixing the components or creating an aqueous solution from the composition. It is recommended that firstly the ethoxylate-type component or components are added followed by the dialkyl sulphosuccinate with wetting ability, then the acidic half ester of alkyl ethoxylate phthalate providing stabilizing effect is added followed by addition of hydrogen peroxide. As a last step of preparation, the excipients less significant for the basic effect are added in optional order. Due to high viscosity of alkyl and/or alkyl-aryl ethoxylates, preparation of the composition containing concentrated active agent is favorably carried out in aqueous solution with a water content of 35 to 75 mass %, favorably 40 to 60 mass % (including water content of applied aqueous H_2O_2 solution.

The invention is presented with the following examples.

Example 1

445 liters of water adjusted to 20 to 30°C is added to an enameled mixer container during mixing. Afterwards 80 kg of ethoxylate grade 10 nonilphenol polyglycol ether, 120 kg of saturated alkyl groups having from 10 to 18 (averagely 16.2) carbon atoms, alkyl polyglycol ether having 4 ethoxy groups, 15 kg of aqueous solution of 25 mass % (active agent: 3.75 kg) dioxtyl sulphosuccinate sodium salt, then the stabilizer of hydrogen peroxide is reconstituted in the water, the latter is 25 kg of (100% concentration) acidic half ester of alkyl polyglyco phthalate that has alkyl polyglycol ether in ester binding with saturated alkyl groups having from 10 to 18 (averagely 16.2) carbon atoms and 4 ethoxy groups. After that 285 kg of 35 mass % technical hydrogen peroxide, 50 liters of 1st quality class ethyl alcohol and 6 kg of citric acid and 4 kg of phosphorous acid are added to the system. After continuous mixing, a slightly yellowish, transparent composition with a viscosity similar to water is obtained that besides its antimicrobial effect is suitable for intensive and quick blood removal of medical instruments and devices.

To express the compared assessment of the product based on the invention, measurements were carried out. During our measurements, blood dissolving effects of the composition in Example 1, pharmacology quality 30% hydrogen peroxide (Hidrogenium peroxidatum concentratum, Ph. Hg. VII) and the proteolytic enzyme containing agent called Haemopon (Növényolajipari és Mosószergyártó Vállalat, Budapest) that is currently in use in medical practice were compared.

1, 2, 3, 4 and 5 mass % solution with a volume of 1 liter were prepared from the analyzed agents and blood-dissolving ability was determined in relation to concentration. In case of the composition based on the invention and hydrogen peroxide, blood dissolving effect studies were carried out in 20°C solution with 30 minutes of effect duration, while in case of Haemopon, according to the applicable guidelines

(Dr. Pecho, Z-Dr. Milassin, M: Tájékoztató a sterilizálásról, Budapest 1985, 45. oldal) temperature of the applied solution was 60°C with an effect duration of 90 minutes. Determination of blood dissolving ability was performed by the guidelines of patent No. MSZ-0331-81 that substantially uses a so-called Gregersen reagent to very sensitively detect traces of undissolved blood by color reaction. Results are summarized in Table 1.

Table 1

Study product	Product concentration in 1 l of solution (volume%)	H_2O_2 equivalent concentration in 1 l of solution (mass%)	Dissolved blood amount Exp. time: 30 mins Temp.: 20°C (mL)
Composition according to Example 1	1	0.12	15
	2	0.25	30
	3	0.36	45
	4	0.50	60
	5	0.60	75
Hydrogen peroxide (Ph.Hg.VII) pharmacological quality	1	0.3	2
	2	0.6	4
	3	1.0	5
	4	1.3	10
	5	1.7	15
Haemopon	Product concentration in 1 l of solution (volume%)	Enzyme concentration in 1 l of solution (mass%)	Dissolved blood amount Exp. time: 90 mins Temp.: 60°C (mL)
	1	0.02	0.05
	2	0.04	0.1
	3	0.06	0.2

Based on the table data strong blood-dissolving ability of the composition based on the invention is obvious. Based on the measured data, two essential observations can be recorded:

a) 1 liter of the 5 volume % composition according to the invention having an active H_2O_2 content of 0.6 mass % can dissolve 5 times greater amount of blood than the same amount of 5 volume % pharmacological quality hydrogen peroxide solution, in which mass % of the active H_2O_2 content is almost thrice (1.7 mass %) of the above. This fact proves that the detergent composition in the composition according to the invention significantly increases blood-dissolving ability of hydrogen peroxide.

b) The 5 volume % composition according to the invention is capable of dissolving almost 200 times greater amount of blood than the Haemopon solution with the same concentration and amount, which product is also based on composition of detergents and contains a protelytic enzyme and is currently in use for blood removal in medical practice.

Example 2

The method in Example 1 is used with the exception that 330 kg of 30 mass % hydrogen peroxide solution is added to 370 liters followed by 60 kg of alkylphenol polyglycol ether with alkylene groups having 6 carbon atoms and an ethoxylate grade of 6 and adding 140 kg of alkyl polyglycol ether with alkyl groups having 8 carbon atoms and an ethoxylate grade of 2.

Amount of the added hydrogen peroxide stabilizer remains 25 kg with the exception that an acidic half ester of alkyl polyglycol phthalate is used in which the alkyl polyglycol ether in the ester binding has an alkyl group having six carbon atoms and an ethoxylate grade of two. Example 1 should be followed regarding the amount and composition of all other added components. A solution substantially the same as in Example 1 but with a somewhat lower viscosity is obtained that has the same blood removal and blood dissolving abilities as the product in Example 1 and the same H2O2 content as the product in Example 1.

Bacteriostatic effect of the product was analyzed with the method and assessment of "Richtlinien für die Prüfung und Bewertung chemischer Desinfektionsverfahren" (Gustav Fischer Verlag, Stuttgart, New York, 1981). Results are summarized in Table 2.

Table 2

Test bacterium description	Concentration necessary to inhibit reproduction	
	Conc. of product according to Example 2 (mass%)	Active H_2O_2 conc. (micro-gram/mL)
Staphylococcus aureus	0.03	29.7
Escherichia coli HNCMB 3301	0.05	49.5
Pseudomonas aeruginosa HNCMB 170001	0.25	247.5
Salmonella typhi HNCMB 15005	0.06	59.4
Proteus vulgaris HNCMB 60001	0.02	19.8

"In vitro" tests were carried out on 18-hour bouillon culture of the 3rd bacterial subculture. Without referring to detailed comparative results, results show that bacteriostatic effect of the composition according to the invention is very significant at very low threshold level.

Example 3

The method in Example 1 is used with the exception that 100 kg alkylphenol polyglycol ether with alkylene groups having 18 carbon atoms and an ethoxylate grade of 12 is added to 370 liters of water and the added 100 kg of alkyl polyglycol ether has an alkyl group having 20 carbon atoms and an ethoxylate grade of 8. Amount of the added acidic half ester of alkyl polyglycol ether phthalate remains 25 kg, in which the alkyl polyglycol ether in the ester binding has an alkyl group having 18 carbon atoms and an ethoxylate grade of 8. Example 1 should be followed regarding the amount and composition of other added components. A solution with similar effects to Examples 1 and 2 but with a somewhat higher viscosity is obtained. Bactericide effect of the product was measured with methods described in Example 2 with and without the presence of proactive agents associated with the test bacteria.

1% of bovine albumin was added as bactericide effect inhibiting agent. Obtained results are summarized in Table 3.

Table 3

Test bacterium description	Exposure time necessary to bactericide effect (minutes)	
	Protective agent	
	Not present	Present
Staphylococcus aureus HNCMB 110003	3	13
Escherichia coli HNCMB 33001	5	13
Pseudomonas aeruginosa HNCMB 170001	10	18
Salmonella typhi HNCMB 15005	7	15
Proteus vulgaris HNCMB 60001	3	13

Without referring to comparative results, obtained exposure time of measured bactericide effect of the composition according to the invention is very significant.

Example 4 (comparative example)

Everything is carried out as in Example 1 with the exception that the hydrogen peroxide stabilizer alkyl polyglycol phthalate is not added to the invention composition. All other components are present in the amount and quality as described in Example 1. Compositions of Example 1 and 4 were used for 12-month storage and stability studies at 20°C. Storage was carried out in black polyethylene containers and active hydrogen peroxide content was continuously measured by iodometry and is recorded and summarized in mass percent in Table 4.

Table 4

Active H_2O_2 concentration (mass%)		
Time of sample collection	H_2O_2 stabilizer content according to invention in Example 1	Without H_2O_2 stabilizer according to invention in Example 4
1 day after manufacture	9.83	9.61
After 1 month	9.77	7.11
After 2 month	9.64	5.32
After 3 month	9.58	3.17
After 6 month	9.31	3.05
After 9 month	9.12	2.92
After 12 month	8.97	2.61

Based on table data it is obvious that the acidic half ester of alkyl polyglycol ether phthalate – that is the H_2O_2 stabilizer of the invention –

used in the composition according to the invention proves to be very effective. Note that 91 % of stabilized hydrogen peroxide remains active after 12-month storage while in the composition having the very same composition but missing the H_2O_2 stabilizer of the invention active hydrogen peroxide content decreased to only 27 %. Since blood removing and antimicrobial effects presented on the above examples are basically the result of active H_2O_2 content, results of related effects are also strongly linked to active H_2O_2 content present in the product. Due to their unequivocality, detailed discussion of the related results is omitted.

Example 5 (comparative example)

Everything is carried out as in Example 1 with the exception that the quick wetting component of the invention, dioctyl sulphosuccinate (Solovet) is not added to the invention composition. All other components are present in the amount and quality as described in Example 1. Wetting effect of the two compositions was carried out by the DIN 53901 guidelines since – as noted above – wetting effect is crucial in relation to both the blood dissolving and the antimicrobial effects. Principle of the measurement is to place a raw cotton strand on the surface of the tested agent with the required concentration and to measure the time needed for the strand to submerge. Submersion is measured in seconds. The lower this measurement is, the better wetting effect the tested agent has. In the comparative tests, the product of Example 5 without quick wetting component (Solovet) was compared – in respect of wetting effect – to the composition of Example 4 that did not contain the H_2O_2 stabilizer acidic half ester of alkyl polyglycol phthalate but did contain Solovet and to the product of Example 3 that contained both H_2O_2 stabilizer and Solovet. 2 g/L, 5 g/L and 10 g/L concentration solutions were made from the products and the wetting effect was measured. Results are summarized in Table 5.

Table 5

Results of wetting effect (sec.)

	Concentrations		
	2 g/L	5 g/L	10 g/L
Composition according to Example 5	8.3	6.1	4.0
Composition according to Example 4	3.8	2.7	2.1
Composition according to Example 3	3.2	2.7	2.0

Based on table data, two important observations can be made.

a) Dioctyl sulphosuccinate content of the composition significantly increases the wetting effect that is very important from cleaning aspects.

b) The H_2O_2 stabilizer alkyl polyglycol ether phthalate used with dioctyl sulphosuccinate increases wetting effect, though only in a small amount.

The above observations were confirmed by cleaning procedures in practice.

During cleaning experiments, 100 injection needles heavily stained with blood were cleaned by soaking, then assessments were made with Gregersen reagent according to patent No. MSZ 31-81. Cleaning conditions are also recorded in the above patent.

After cleaning with the composition in Example 5, color reaction was positive in case of 14 needles, i.e., cleaning had to be repeated.

After application of compositions in Example 4 and 3 in the same conditions positive color reaction was detected at 2 and 3 needles, respectively, which means effective cleaning according to the patent.

The published results emphatically confirm the principle that during cleaning and treating medical instruments and devices with articulations, narrow gaps and openings the wetting effect of the applied agent is extraordinarily important.

Instead of numeric presentation of general cleaning, blood removing and antimicrobial effects, further examples for preparing the invention composition and possible compositions are presented.

Example 6

The following agents are added to the mixing device mentioned in Example 1 during continuous mixing:

800 liters of water, ethoxylate grade 8 laureth phenol polyglycol ether, 45 kg of 25 % water solution of laureth sulphosuccinate sodium salt (active agent 9 kg), 35 kg of acidic half ester of alkyl polyglycol ether phthalate (100 % active agent), in which the alkyl polyglycol ether in ester binding has 10 carbon atoms and an ethoxylate grade of 6, 395 kg of 30 % technical hydrogen peroxide solution, 80 liters of ethyl alcohol, 10 kg of citric acid, 10 kg of disodium salt of ethylene diaminotetraacetic acid, 10 kg of phosphorous acid. A slightly yellowish, transparent composition with an approx. weight of 1500 kg is obtained that regarding its general cleaning, blood removing and antimicrobial effects is substantially the same as the compositions in the above examples.

Example 7

The following agents are added to the device mentioned in Example 1 during continuous mixing:

445 liters of water, 190 kg of polyglycol ether, in which the alkyl group has 16 carbon atoms and an ethoxylate grade of 6, 30 kg of 25 % water solution of laureth sulphosuccinate sodium salt (active agent 7.5 kg), 20 kg of acidic half ester of alkyl polyglycol ether phthalate (100 % active agent), in which the alkyl

polyglycol ether in ester binding has 12 carbon atoms and an ethoxylate grade of 4, 285 kg of 35 % technical hydrogen peroxide solution, 40 liters of ethyl alcohol, 5 kg of fumaric acid and 5 kg of salicylic acid. Approx. 1000 kg of liquid is obtained that has substantially the same characteristics as the compositions mentioned in the previous examples.

Example 8

Following the steps in Example 7 the following agents are added during continuous mixing:

920 liters of water, 200 kg laureth phenol polyglycol ether according to Example 6, 50 kg of alkyl polyglycol ether according to Example 7, 8 kg of 25 % water solution of laureth sulphosuccinate sodium salt (active agent 2 kg) according to Example 7, 17 kg of acidic half ester of alkyl polyglycol ether phthalate according to Example 7, 265 kg of 30 % hydrogen peroxide solution, 20 liters of ethyl alcohol, 8 kg of salicylic acid, 4 kg of citric acid, 8 kg of phosphorous acid.

Approx. 1500 kg of liquid is obtained that has substantially the same characteristics as the compositions mentioned in the previous examples.

Example 9

Following the steps in Example 8 the following agents are added to the device in Example 8, during continuous mixing:

915 liters of water, 150 kg laureth phenol polyglycol ether according to Example 6, 50 kg of alkyl polyglycol ether according to Example 7, 45 kg of 60 % water solution of dihexyl sulphosuccinate sodium salt (active agent 27 kg), 20 kg of acidic half ester of alkyl polyglycol ether phthalate according to Example 7, 280 kg of 35 % hydrogen peroxide solution, 20 liters of ethyl alcohol, 6 kg of salicylic acid, 6 kg of citric acid, 8 kg of phosphorous acid.

Approx. 1500 kg of liquid is obtained that has substantially the same characteristics as the compositions mentioned in the previous examples.

Example 10

Following the steps in Example 9 the following agents are added to the mixer device described in Example 9:

967 liters of water, 150 kg laureth phenol polyglycol ether according to Example 6, 50 kg of alkyl polyglycol ether according to Example 7, 45 kg of 60 % water solution of dihexyl sulphosuccinate sodium salt (active agent 27 kg), 20 kg of acidic half ester of alkyl polyglycol ether phthalate according to Example 7, 228 kg of 35 % hydrogen peroxide solution, 20 liters of ethyl alcohol, 8 kg of salicylic acid, 7 kg of citric acid, 5 kg of phosphorous acid.

Approx. 1500 kg of liquid is obtained that has substantially the same characteristics as the compositions mentioned in the previous examples.

PATENT CLAIM

Composition containing stabilized hydrogen peroxide for general cleaning, blood removal and disinfection of medical instruments *characterized by containing:*

20 mass parts of alkylphenol polyglycol ether with general formula (I) and/or alkyl polyglycol ether with general formula (II), where in formula (I) R_1 is an alkylene group having from 6 to 18 carbon atoms, n means from 6 to 12, in general formula (II) R_2 is an alkyl group having from 8 to 20 carbon atoms or a mixture of these, n' means from 2 to 8

and in 20 mass parts of compound with general formula (I) and/or (II)

0.1 to 3 mass parts of dialkyl sulphosuccinate sodium salt with general formula (III), wherein general formula (III) R_3 is an alkyl group having from 6 to 12 carbon atoms,

from 1 to 4 mass parts of acid half ester of alkyl polyglycol ether phthalate with general formula (IV), wherein general formula (IV) R_4 is an alkyl group having from 6 to 18 carbon atoms or a mixture of these, value of n" is from 2 to 8,

from 8 to 12 mass parts of hydrogen peroxide, and as desired,

from 1 to 20 mass parts of viscosity modifier, ethyl alcohol favorably, complex builder, disodium salt of ethylenediaminotetraacetate favorably, passing additive, phosphorous acid favorably, excipient providing surface brightness to the cleaned instrument, citric acid, salicylic acid, fumaric acid and fragrances and color additives favorably and the mixture of these.

1 page with drawn formulae

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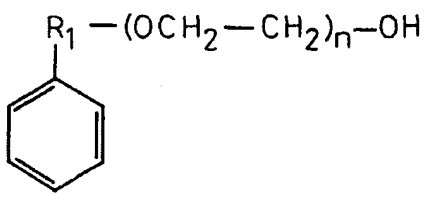
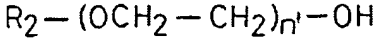


(I)



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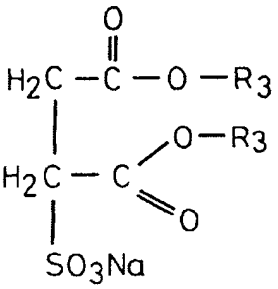
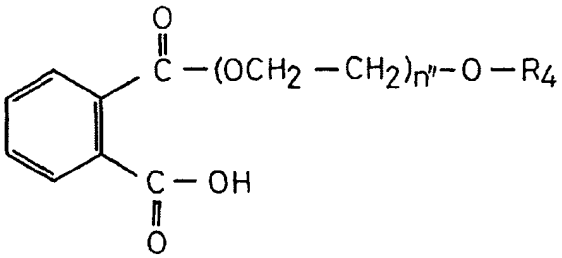


(III)



(IV)

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